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MALOCCLUSION, OR "BUCK TEETH", IN RABBITS 1/

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INTRODUCTION

The permanent teeth of the domestic rabbit consist of four incisors, six premolars, and six molars on the upper jaw; and two incisors, four premolars, and six molars on the lower jaw. The two lower incisors and two upper incisors are large, chisel-shaped, sharp, and well-adapted for gnawing. They grow from persistent pulps and continue to develop during the life of the rabbit to compensate for wear. According to Shadle, 2/, when the four large incisors wear normally, the upper ones grow about 4 inches and the lower ones 5 inches, annually. The two small upper incisors, or "peg teeth", are rod-like and one is placed directly behind each of the large upper incisors. These peg teeth serve as a protection to the tissues of the roof of the mouth from the cutting edges of the lower incisors.

If the large incisor teeth do not meet at the proper angle and wear normally, they become very long causing malocclusion, a condition known as "buck teeth"(Fig.1)

Reports of malocclusion in rabbits come to the United States Rabbit Experiment Station, Fontana, Calif., from all sections of the United States. While an occasional case in a herd of rabbits is not of great economic importance, in some herds the condition appeared to be increasing and was causing alarm. In 1942 an experiment was begun at the Rabbit Experiment Station to determine, if possible, what factor or factors cause malocclusion, methods of treating it, and to determine whether it is inherited.

EXPERIMENTAL ANIMALS, RATIONS, AND EQUIPMENT

The New Zealand breed of rabbits was used in the experiment. The rabbits were housed in all-metal hutches to eliminate any effect on the incisors that might be caused by the animals gnawing on the wooden parts of a wood and wire hutch. The animals were fed a mixture of one or more cereal grains and a pelleted soybean meal in which salt had been added in the proportion of 1 lb. of salt to each 100 lbs. of meal. Approximately 1.10 pound of green alfalfa was fed each rabbit daily for 10 months and green barley during 2 winter months of each year. Water and a good quality alfalfa hay were available at all times.

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1/ Formerly Wildlife Leaflet 248 issued by the Fish and Wildlife Service, United States Department of the Interior.

2/ The Attrition and Extrusive Growth of the Four Major Incisor Teeth of Domestic Rabbits, by Albert R. Shadle. Journal of Mammology, Volume 17, No. 1, pp. 15021. February 1936.

## INFORMATION OBTAINED FROM THE EXPERIMENT

During the study, which was carried on for 39 months, 316 rabbits were used. They were inspected periodically to determine the growth of the incisors, the effect of malocclusion on the animals, and methods for its control.

The cases of malocclusion were easily and accurately diagnosed by examining the incisors of the young when weaned at 8 weeks of age. In many instances, the only symptom noted was the long incisors. In every case observed the upper incisors turned inward and the lower ones outward. In the more advanced stages the symptoms noted were loss of flesh, rough fur, drooling, wet fur on the lower jaw, long incisors, and fur wound around the front teeth.

The abnormally long incisors (Fig. 2) interfered with eating and it was necessary periodically to cut them back to normal length with a pair of sharp, side-cutting pliers. Forty-six cases were treated in this manner. The number of times the teeth had to be cut and the length of time between cuttings depended on the angle at which the incisors grew. If they were only slightly out of alignment, one cutting was sufficient to permit the teeth to meet and wear normally. In more serious cases, repeated cutting was necessary to make it possible for the animal to eat. Where the teeth were badly out of alignment, they were cut every 3 or 4 weeks during the life of the animal. In the case of one rabbit (herd buck No. 99-), kept on the test until it was 3 years, 8 months old, it was necessary to cut the teeth 56 times.

In the malocclusion cases in this test, the average annual growth of the upper incisors was 5.4 inches and that of the lower 8.4 inches.

The original test animals for the experiment were selected from the main experimental herd, in which malocclusion occurred at the rate of only 0.0016 percent. Inbreeding (brother-sister or parent-offspring matings) was practiced to purify the germ plasm and thereby assist in determining whether malocclusion is an inherited condition. Of 16 inbred litters weaned at 8 weeks of age, 26.8 percent of the animals showed malocclusion. The range in number of cases occurring in these litters varied from none to one hundred percent. This rapid increase in the percentage of cases from 0.0016 to 26.8 percent is proof that the characteristic is inherited.

One litter of seven of a particular mating did not prove adequate for determining whether the parents were carrying the gene for malocclusion. Does and bucks so characterized may transmit buck teeth to their offspring even though they themselves are normal.

In the main experimental herd, 35 cases of malocclusion due to abscesses in the region of the molars, the jaw, or below the eye occurred. These animals showed evidence of pain. The abscesses interfered with normal mastication and wearing of the incisors, and malocclusion developed. Cases due to abscesses must not be confused with the inherited type.

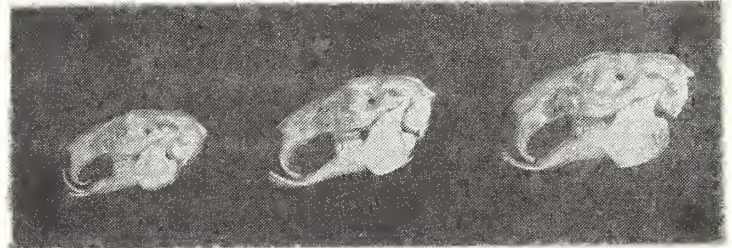




FIGURE 1

Rabbit skulls showing both normal teeth and malocclusion. In the one at the left the incisors grew at the proper angle so that development and the wearing off process progressed normally; the chisel-shaped surfaces of the larger upper and the lower incisors, and the peg teeth, can be seen. The skull at the right shows a typical case of malocclusion, the upper incisors turning inward, the lower ones outward.

FIGURE 2



Skulls of rabbits of different ages, showing malocclusion. The one at the left is from a  $3\frac{1}{2}$ -month-old, untreated rabbit; the left lower incisor has been broken off. The one in the center is from a 10-month-old rabbit, the incisors of which were cut back 3 times. The one at the right is from a rabbit 3 years, 8 months old, the incisors of which were cut back 56 times.

#### RECOMMENDATIONS

Breeders should make a practice of examining the incisors of all young rabbits that are to be retained or sold for breeding purposes when they are weaned at two months of age. Malocclusion, or buck teeth, can be easily and accurately diagnosed at that age, although an occasional case may develop later.

The long incisors of rabbits with malocclusion should be cut back periodically to normal length with a pair of sharp, side-cutting pliers, to make it possible for the animals to eat properly and attain good condition for slaughter.

Malocclusion is inherited, and to eradicate this undesirable characteristic from the herd it is necessary that no does or bucks be selected for breeding, the parents of which have produced young in which malocclusion has developed. Extreme vigilance must be maintained in this matter for does and bucks, even though they have normal teeth, may yet be carriers of the gene for malocclusion and transmit the characteristic to their offspring.

